

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
WACO DIVISION**

WSOU INVESTMENTS, LLC D/B/A
BRAZOS LICENSING AND DEVELOPMENT,

Plaintiff,

v.

JUNIPER, INC.,

Defendant.

Nos. 6:20-cv-00812-ADA
6:20-cv-00813-ADA
6:20-cv-00814-ADA
6:20-cv-00815-ADA
6:20-cv-00902-ADA
6:20-cv-00903-ADA

JURY TRIAL DEMANDED

BRAZOS'S OPENING CLAIM CONSTRUCTION BRIEF

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- 4 excerpts from Ravindra K. Ahuja et al., *Network Flows: Theory, Algorithms, and Applications* (1993) (WSOU-Juniper-0004035)
- 5 excerpts from Thomas H. Cormen et al., *Introduction to Algorithms* (2d ed. 2001) (WSOU-Juniper-0004932)
- 6 Fujitsu, *GMPLS Signaling Protocol Interoperability Test in Multilayer Network* (May 20, 2003), available at <https://www.fujitsu.com/global/about/resources/news/press-releases/2003/0520-11.html> (WSOU-Juniper-0003340)
- 7 excerpts from file history for U.S. Patent No. 8,284,656 (U.S. Pat. App. No. 11/443,101)
- 8 RFC 3471, *Generalized Mutli-Protocol Label Switching (GMPL) Signaling Functional Description* (WSOU-Juniper-004898)
- 9 CiteSeerX, *Citation Query: Introduction to Algorithms*, <http://citeseerx.ist.psu.edu/showciting?cid=1910> (last access March 12, 2021) (WSOU-Juniper-0003113)
- 10 Larry Hardesty, *Milestone for MIT Press’s Bestseller*, MIT News (Aug. 10, 2011), available at <https://news.mit.edu/2011/introduction-to-algorithms-500k-0810> (WSOU-Juniper-0003938)
- 11 Julianne Walker, *Red Black Tree Tutorial*, Eternally Confuzzled http://www.eternallyconfuzzled.com/tuts/datastructures/jsw_tut_rbtrees.aspx, available at https://web.archive.org/web/20141129024312/http://www.eternallyconfuzzled.com/tuts/datastructures/jsw_tut_rbtrees.aspx (last accessed March 12, 2021) (WSOU-Juniper-0003115)
- 12 J. Bluestein, *Scholarly Resources for CompSci Undergrads*, <http://web.cs.dal.ca/~jamie/UWO/.Refs/tech-books.html> (last accessed March 12, 2021) (WSOU-Juniper-0003943)

I. INTRODUCTION

Brazos asserts infringement of six patents¹ that describe methods and systems that allow for more effective and efficient management of enterprise computer networks. These patents use claim language that is familiar to those skilled in the relevant art, and there is a heavy presumption that the claim terms should be given their plain and ordinary meanings. There are only two exceptions to this familiar rule: when the patentee acted as a lexicographer and defined the term and when there is a clear disavowal of claim scope.

Brazos applies these established principles here, proposing the disputed terms should have their plain and ordinary meanings except where one of the two exceptions clearly applies. Juniper, by contrast, offers complicated constructions that are contrary to both the language of the patents and claim construction principles. For example, Juniper seeks to import limitations from the specifications without any basis in the intrinsic evidence, including for commonly understood terms. Juniper’s proposed constructions invite error. They should be rejected.

II. U.S. PATENT NO. 7,382,781 (CASE NO. 6:20-CV-00812-ADA)

In computer networking “unicast” and “multicast” are words that refer to how information is transferred from a sending device (or “node”) to one or more receiving devices (or “nodes”). “Unicast” refers to the transmission of information via “[a] single communication between two [] nodes in one direction.” *Id.* at 2:13–15. Using unicast transmission, if a device wants to send the same file to multiple destination devices, it transmits individual copies of the file separately to each destination device, akin to mailing individual letters with the same information to multiple recipients. “Multicast” refers to the transmission of information by a

¹ This brief addresses the constructions of terms from five of those patents. The parties do not contend that any of the terms of U.S. Patent No. 7,483,998, which is asserted in Case No. 6:20-cv-00813, require construction or are indefinite.

single source node “to more than one destination [] node.” *Id.* at 2:15–17. Using multicast transmission, under the same scenario as above, the sending device could send a single copy of the file and have it be received by each of the multiple destination devices. This is useful in many instances, including, for example, when transmitting large files, such as video streams.

The ’781 patent addresses a problem that arose when networks routed both unicast and multicast traffic. Prior to the ’781 patent, networks would use the same routing paths to send both unicast and multicast traffic. *Id.* at 2:19–22 (*i.e.*, “multicasting ... [wa]s achieved by sending packet traffic on multiple point-to-point interfaces between [] nodes that [we]re already communicating unicast packet traffic”). This had a downside in that it could overburden paths by requiring them to carry both types of traffic, which could cause delays in the delivery of the traffic and congestion. *Id.* at 2:22–30 (“if a particular [path] is particularly burdened by already-existing unicast traffic, then that same [path] [would be] further burdened by the additional multicast traffic that is then sought to communicate along the same [path]. This may be problematic as one or more LSPs carrying delay-sensitive unicast traffic are then disturbed by the addition of the multicast traffic. Also, certain regions of the [network] may be congested while others are not.”).

The ’781 patent addresses this problem by providing a network architecture “that more efficiently accommodates both unicast and multicast traffic.” *Id.* at 2:31–34. In particular, the ’781 patent describes that unicast traffic is routed according to a “first traffic configuration,” such as that shown in Figure 1a, *see id.* at 2:55–57, 3:65–4:8, 4:12–17, 4:43–45, while multicast traffic is routed “in a second overall routing configuration that differs at least in part from the first overall configuration,” such as that shown in Figure 1b, *id.* at 4:17–20; *see also id.* at 2:58–60, 4:41–43. This system “allows for optimization of the [path] resources for multicast traffic,”

id. at 9:58–59, while at the same time, “no new [paths] []are needed to accommodate multicast communications beyond those used for unicast communications,” *id.* at 9:59–61.

A. The “centralized node for coupling into a computer network” (claim 1)

Brazos’s Position	Juniper’s Proposed Construction
plain and ordinary meaning, preamble not limiting	the “centralized node” term in the preamble is limiting, and the “identifying,” “constructing,” and “communicating” steps are performed by the “centralized node”

The portion of the preamble of claim 1 of the ’781 patent that recites a “centralized node for coupling into a computer network” is not limiting and does not need to be construed because it does not “recite[] essential steps or structure,”² and is not “necessary to give life, meaning, and vitality” to the claim.³

This term appears in the preamble of a claim and is, therefore, presumptively non-limiting.⁴ While “[n]o litmus test defines when a preamble limits claim scope,” “dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention.”⁵ “Conversely, a preamble is not limiting ‘where a patentee defines a structurally complete

² *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002).

³ *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999).

⁴ See *Ancora Techs., Inc. v. LG Elecs. Inc.*, No. 1:20-cv-00034-ADA, 2020 WL 4825716, at *6 (W.D. Tex. Aug. 19, 2020) (“Courts presume that the preamble does not limit the claims.” (citing *Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358 (Fed. Cir. 2010))); see also *Georgetown Rail Equip. Co. v. Holland L.P.*, 867 F.3d 1229, 1236 (Fed. Cir. 2017) (“Generally, the preamble does not limit the claims.” (citations omitted)).

⁵ *Catalina Mktg. Int’l*, 289 F.3d at 808 (citing *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989)); *Bell Commc’ns Rsch., Inc. v. Vitalink Commc’ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995).

invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.”⁶

The “centralized node” phrase does not provide antecedent basis for any term recited in the body of claim 1, or in any claim (2–10) that depends from claim 1.⁷ Nor does it provide any essential structure necessary to perform the claims steps that the invention must be programmed to perform. While the patent describes that “there is a centralized node for coupling into a computer network” “[i]n the preferred embodiment,” *id.* at 2:38–40, *see also id.* at 4:26–29, 4:45–48, it does not describe that the invention *must* be performed by a centralized node.⁸ Rather, the patent describes that “while the present embodiments have been described in detail, various substitutions, modifications or alternations could be made to the descriptions ... without departing from the inventive scope which is defined by the ... claims,” *id.* at 9:65–10:3. Thus, it is clear that the preamble’s recitation of a “centralized node for coupling into a computer network” is merely a statement of “intended use for the invention” and should not be construed as limiting.⁹

⁶ *Catalina Mktg. Int’l*, 289 F.3d at 808 (quoting *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)).

⁷ The phrase “wherein the centralized node is further programmed to perform a step of ...” does appear in claim 9, but it merely mirrors the preamble of claim 1 (which recites “A centralized node ... programmed to perform the steps of ...”) and serves as a preamble for the claim limitation “constructing a different respective second traffic configuration along the network for each group in the more than one group of nodes.”

⁸ *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004) (“[I]t is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.”).

⁹ *See Rowe*, 112 F.3d at 478.

B. “second traffic configuration” (claims 1, 9, 18)

Brazos’s Proposed Construction	Juniper’s Proposed Construction
plain and ordinary meaning	“a multicast routing configuration developed by the centralized node” (claims 1 and 9) “a multicast routing configuration developed by a centralized node” (claim 18)

This term is easily understood on its own without further construction in the context of the claims themselves, which specifically describe how the claimed “second traffic configuration” functions in the invention. Juniper’s construction improperly seeks to impose limits that are unsupported by the claims.

Juniper’s construction of “second traffic configuration” as “multicast routing configuration” is redundant, as the claims themselves specifically define how the “second traffic configuration” relates to the routing of multicast packet traffic. For example, independent claim 1 recites that “the second traffic configuration is for routing multicast packet traffic along the network,” and independent claim 18 recites “communicating multicast packet traffic along the network according to a second traffic configuration.” Juniper’s construction mirrors the express requirements of the claims and is, therefore, duplicative and unnecessary.

If Juniper contends that its construction is not duplicative because “multicast routing configuration” means something other than “configuration ... for routing multicast packet traffic along the network,” as stated in the claims, that contention should be rejected for creating ambiguity and confusion regarding the language already used explicitly in the claims. To the extent that Juniper’s proposed construction would impose any limitation beyond those stated in the claims, it should be rejected as inconsistent with the language the applicants choose to claim

their invention.¹⁰ The applicants did not act as lexicographers to define their inventions to include the additional limitation proposed by Juniper, and did not disclaim any scope of their inventions.

Juniper’s construction of “second traffic configuration” as needing to be “developed” by a “centralized node” is also unsupportable. As discussed above, the only place in claim 1 that recites a “centralized node” is the preamble, which is not limiting. Claim 18 does not include any limitation requiring the use or presence of any “centralized node.” It is improper for Juniper to impose a requirement of “centralized node” into the claims where no such limitation exists. Although the specification describes that “[i]n the preferred embodiment, central manager CM is intended to be the overall function that develops the multicast communications configuration,” ’781 Patent at 4:27–29; *see also id.* at 4:45–48, “it is improper to read limitations from a preferred embodiment described in the specification—even if it is the only embodiment—into the claims absent a clear indication in the intrinsic record that the patentee intended the claims to be so limited.”¹¹

Juniper’s requirement that the “second traffic configuration” must be “developed” improperly replaces the language chosen by the applicants with a term chosen by Juniper. Although the patent uses versions of the word “develop” to describe the creation of the second traffic configuration in several locations,¹² it also, more frequently, uses versions of the word

¹⁰ *See K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999) (“Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.”); *Pisony v. Commando Constr., Inc.*, No. 6:17-cv-00055-ADA, 2019 WL 928406, at *6 (W.D. Tex. Jan. 23, 2019) (“[T]he Court finds such a substitution unnecessary because the words chosen by the scrivener ... are more than adequate to be understood by one who is skilled in the art.”).

¹¹ *Liebel-Flarsheim Co.*, 358 F.3d at 913.

¹² *See* ’781 patent at 4:22–23 (“Various details are provided later as to the development of the second, or multicast, configuration.”), 4:27–29 (“In the preferred embodiment, central manager CM is intended to be the overall function that develops the multicast communications

“constructing” when providing specific teachings about how a second traffic configuration can be created.¹³ Claim 1 requires “*constructing* [the] second traffic configuration” (emphasis added).¹⁴ Thus, the applicants’ decision to claim “constructing [the] second traffic configuration” in this claim should be respected, not substituted or erased according to Juniper’s preference.¹⁵ Any alternative requirement or language is not required by the claims and is not mandated by any lexicography or disclaimer.

III. U.S. PATENT NO. 7,518,990 (CASE NO. 6:20-CV-00814-ADA)

In computer networking, multiple physically separate routes for transferring data may be combined through a technique generally known as “[v]irtual concatenation.” ’990 patent at 1:29–32. Routes that are combined together in this manner can be referred to as “a virtually-concatenated group (VCG).” *Id.* Using a VCG, a single transmission stream may be divided into multiple “different data streams [that] may then be transmitted over diverse routes through the network from the source node to a given destination node, also referred to herein as a sink node[,] ... [which] recombines the streams to reconstruct the original VCG.” *Id.* at 1:32–36.

configuration in system 10.”), 4:45–47 (“Specifically, in the preferred embodiment, central manager CM develops the second overall routing configuration”).

¹³ See generally *id.* at 5:5–7:60, including 5:5–8 (“In the preferred embodiment, the second overall routing configuration ... is constructed by central manager CM ...”), 5:61–63 (“in an ideal example, the preferred embodiment central manager CM constructs the second overall routing configuration ...”).

¹⁴ Similarly, dependent claims 19 and 20, which are not asserted in this case, but which relate to asserted independent claim 18, include limitations relating to “constructing the second traffic configuration.”

¹⁵ See *K-2 Corp.*, 191 F.3d at 1364 (“Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.”); *Pisony*, 2019 WL 928406, at *6 (“[T]he Court finds such a substitution unnecessary because the words chosen by the scrivener ... are more than adequate to be understood by one who is skilled in the art.”).

Because a VCG combines multiple separate routes, the VCG is able to transfer larger amounts of bandwidth than the individual routes that make it up. This can cause a potential problem when one of the routes associated with a VCG fails, requiring the VCG to “operate at reduced capacity.” *Id.* at 1:41–45. Conventional techniques of addressing these failures “generally utilize[d] 1+1 primary backup protection, wherein each primary route has a corresponding backup route, resulting in 100% bandwidth overhead.” *Id.* at 1:51–55. Reserving this amount of bandwidth for backup purposes, as opposed to having it be available for the ordinary, “primary” transmission of data, was “excessive” and costly. *Id.* at 1:50–51. Alternative techniques involved “transmit[ting] the data without providing any protection at the SONET/SDH layer of the network,” but this also led to “a number of significant problems, such as disruption of data traffic for up to several seconds, loss and duplication of data, etc.” *Id.* at 2:1–11.

Recognizing these issues, the inventors of the ’990 patent developed “improved routing algorithms for use in determining restoration routes for ... data traffic which utilize virtual concatenation.” *Id.* at 3:43–47. These new routing algorithms “facilitate the implementation of low-overhead, standards-compliant fast restoration techniques.” *Id.* at 13:23–27. In certain embodiments, these algorithms are able to ensure “that a single node or link failure does not affect more than a designated [maximum] amount [] of the total bandwidth” of the VCG, by, *e.g.*, “ensur[ing] that an average rate, such as 30% below the peak rate, is maintained even after failures.” *Id.* at 7:3–10. In other embodiments, these algorithms ensure “that a single node or link [failure] affects the minimum [possible] bandwidth.” *Id.* at 7:11–12.

- A. **“routing algorithm determines the routes in a manner that ensures that failure of a single link in the network does not affect more than a designated maximum amount X of a bandwidth B of the traffic demand” (claims 1, 17, 18) / “routing algorithm determines the routes in a manner that ensures that failure of a single link in the network affects a minimum amount of a bandwidth B of the traffic demand” (claim 6)**

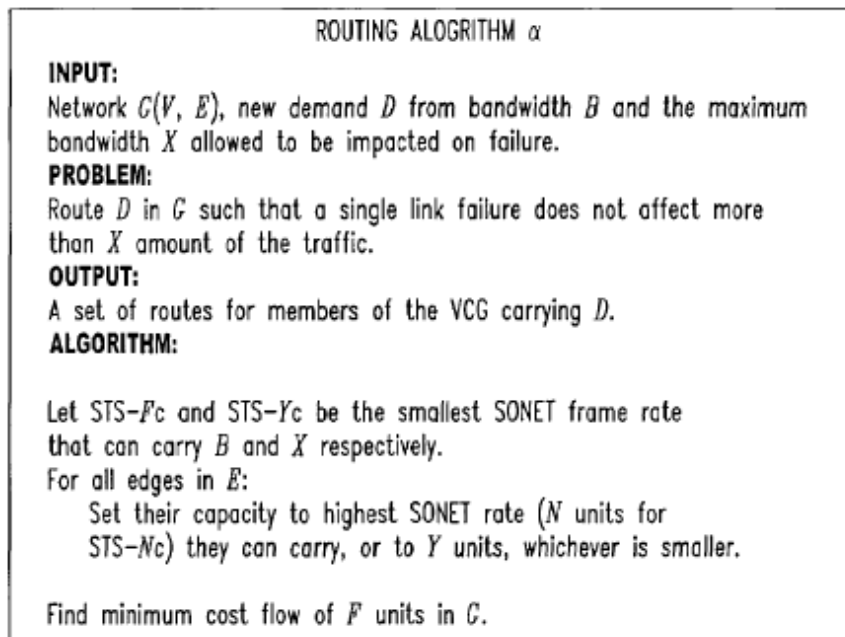
Brazos’s Position	Juniper’s Position
plain and ordinary meaning, not indefinite	indefinite

These terms are not indefinite because a person of ordinary skill in the art would have no difficulty understanding the scope of the “routing algorithm[s]” described, including how those algorithms make use of “a designated maximum amount” of a bandwidth and “ensure[] that failure of a single link in the network affects a minimum amount of a bandwidth.” *See* Ex. 1, Declaration of Scott Nettles, Ph.D. (“Nettles Decl.”) at ¶¶ 25–33.

The heart of this dispute is Juniper’s incorrect assertion that the phrases “maximum amount” and “minimum amount” within these terms create ambiguity. But in the context of these claims and the field of invention—which includes widely known algorithms to ensure that failure of a link “does not affect more than a designated maximum amount” of a bandwidth or “affects a minimum amount” of a bandwidth, including those described and incorporated by reference by the ’990 patent—there is no ambiguity. The “designated maximum amount” of a bandwidth recited in claims 1, 17, and 18 is a specific input to the claimed routing algorithm, and a person of ordinary skill in the art would easily be able to identify whether a particular algorithm has such an input. A person of ordinary skill in the art would also be familiar with how to determine if a particular algorithm determines routes “in a manner that ensures that failure of a single link in the network affects a minimum amount of a bandwidth,” as recited in claim 6, such as by calculating each alternative route and identifying and using the route that results in smallest loss of bandwidth, as is taught by the patent.

The term “designated maximum amount” is used in claims 1, 17, and 18 and in the specification to “refer to an input to the [claimed] routing algorithm.” Ex. 1, Nettles Decl. at ¶ 27. The patent describes a particular scenario (“A”) where one designates as an input to a routing algorithm a maximum amount of bandwidth that may be affected by a failure in the network. In particular, the patent provides the example of “a particular gigabit (Gb) Ethernet service” in which “traffic is provisioned for a peak rate but a service provider needs to ensure that an average rate, such as 30% below the peak rate, is maintained even after failures.” ’990 patent at 7:3–10. A person of ordinary skill in the art would understand that in this scenario, 30% of the peak traffic demand is the designated maximum bandwidth that could be affected by a failure. *See* Ex. 1, Nettles Decl. at ¶ 28.

The specification of the ’990 patent further provides an exemplary embodiment of a routing algorithm (“ α ”)—depicted in Figure 2 (reproduced below) and described at length at 7:31–9:3—that teaches exactly how such an input can be used.



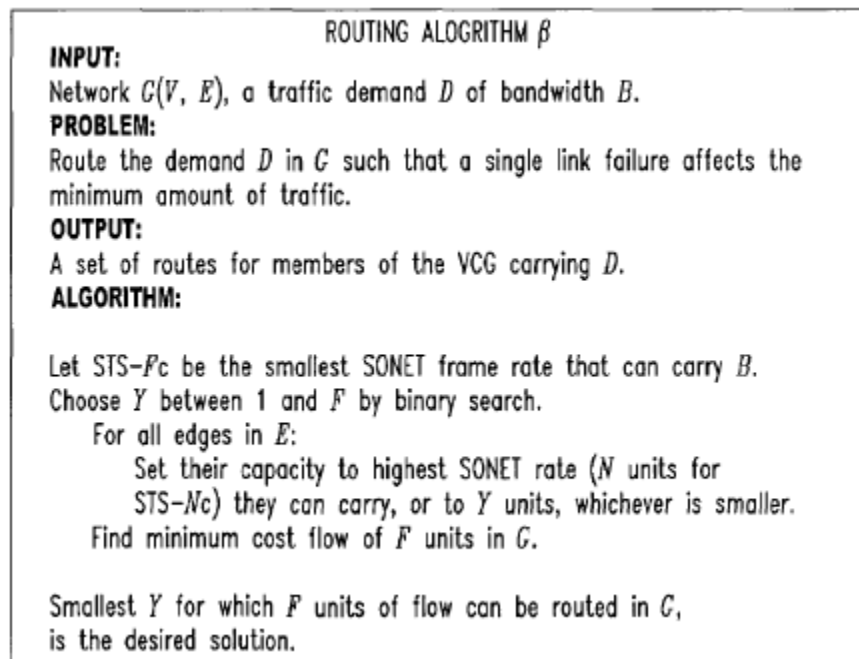
’990 patent at FIG. 2

The patent describes this routing algorithm as addressing the need to “rout[e] the [traffic] demand D ... such that a single link failure does not affect more than *the designated maximum amount [of bandwidth] X*.” *Id.* at 7:38–41 (emphasis added). This exemplary routing algorithm utilizes this input designating the maximum amount of bandwidth that may be impacted by a failure by determining “the smallest SONET frame rates that can carry [bandwidth] B and [maximum amount of bandwidth that may be impacted on failure] X,” which “allows [units of flow] F and Y to be determined from B and X, respectively.” *Id.* at 7:44–47. Based on this, the algorithm creates a network graph (G) in which “all link capacities ... reflect the largest SONET rate that can be carried,” *id.* at 7:51–53, and uses “[a]ny type of conventional flow routing algorithm may be used to determine the feasible flow for F units of flow in the graph G,” *id.* at 7:57–59.

A person of ordinary skill in the art would understand how this algorithm, which is an exemplary embodiment of the algorithm of claims 1, 17, and 18, uses the input “designated maximum amount of bandwidth” to determine a network graph that satisfies the restriction of the input, *see* Ex. 1, Nettles Decl. at ¶ 28, and would know how to program and use such a routing algorithm that uses these inputs, *see id.* at ¶ 27. The specification teaches how the use of known “conventional flow routing algorithm[s]” can be used to calculate “a minimum-cost feasible flow of F units of flow,” ’990 patent at 7:54–8:13, and a person of ordinary skill in the art would recognize that these “can be utilized to ensure that failure of a single link does not affect more than a maximum amount of bandwidth of the traffic demand,” Ex. 1, Nettles Decl. at ¶ 29; *see also id.* at ¶ 30.

A person of ordinary skill in the art would also understand how the term “minimum amount” is used in claim 6. They would know “how to program a routing algorithm to solve [the

problem of ensuring that the failure of a single link in a network affects a minimum amount of a bandwidth] ... and would have no difficulty determining whether a routing accomplishes the goal of solving that problem.” See Ex. Nettles Decl. at ¶ 31. As with the exemplary algorithm “ α ” discussed above, the specification discloses an exemplary scenario (“B”) and embodiment of a routing algorithm (“ β ”)—depicted in Figure 3 (reproduced below) and described at length at 9:4–35—that “teaches a person of ordinary skill exactly how a routing algorithm can solve such a problem.” Ex. 1, Nettles Decl. at ¶ 32.



'990 patent at Fig. 3

The patent makes clear that this “algorithm β achieves this objective [of minimizing the damage on failure] in an effective manner.” '990 patent at 9:11–15; *see also id.* at 7:11–12.

A person of ordinary skill in the art would understand how this algorithm, which is an exemplary embodiment of the algorithm of claim 6, achieves this objective and thereby satisfies the requirements of claim 6. For example, the specification teaches that exemplary “algorithm β ” may use similar minimum-cost flow algorithms as “algorithm α ” “but also operates to identify

the smallest value of Y , *i.e.*, the value representing the minimum damage on failure, for which the given units of flow (F) can be routed in the network (G).” *See* Ex. 1, Nettles Decl. at ¶ 32.

First, the algorithm β uses algorithm α “to determine routing sets for multiple values of Y and then attempt[s] to route traffic according to them.” *Id.*; *see also* ’990 patent at 9:23–29 (“Algorithm β initially lets STS- F_c be the smallest SONET frame rate that can carry B . Once F is determined from B in this manner, algorithm β chooses a value of Y , representing damage on failure, by doing a binary search between 1 and F . For each value of Y , algorithm β first alters the link capacities as in algorithm α and then attempts to route the flow of F units in G .”). It is then “able to determine the solution that affects the minimum amount of bandwidth, which it identifies as the best solution.” Ex. 1, Nettles Decl. at ¶ 32; ’990 patent at 9:30–35 (“For each value of Y , algorithm β attempts to find a solution, if such a solution exists, where bandwidth B can be routed such that no link failure will affect more than an STS- Y_c amount of bandwidth, again assuming that VCG members comprise STS-1 circuits. ***The smallest value of Y for which F units of flow can be routed in G is the best solution.***” (emphasis added)). Thus, because the algorithm evaluates multiple possible routing sets and determines which results in a failure having the smallest possible impact on bandwidth, the algorithm satisfies the criteria of “determin[ing] the routes in a manner that ensures that failure of a single link in the network affects a minimum amount of a bandwidth B of the traffic demand.” ’990 patent at claim 6. A person of ordinary skill in the art “would be familiar with how to program and use a routing algorithm [such as exemplary algorithm β] that minimizes the amount of bandwidth affected by the failure of a network link,” including based on these teachings of the ’990 patent, and “would be able to analyze a routing algorithm to determine whether it operates to determine routes in [such] a manner,” *See* Ex. 1, Nettles Decl. at ¶ 32, as recited in claim 6.

Because a person of ordinary skill in the art would understand how to program and use the claimed routing algorithms, including by making use of “a designated maximum amount” of a bandwidth and “ensure[] that failure of a single link in the network affects a minimum amount of a bandwidth,” and would be able to determine whether a given routing algorithm satisfied these criteria, Juniper cannot meet its high burden to prove by clear and convincing evidence that these terms are indefinite.¹⁶

IV. U.S. PATENT NO. 7,596,140 (CASE NO. 6:20-CV-00815-ADA)

In computer networks that use virtual connections, the virtual paths through which data is transferred from one device (or “node”) to another device may be referred to as “Label Switched Paths” or “LSPs.” ’140 patent at 1:7–9. Networks, and the devices within them, can form and manage LSPs according to different standards or techniques. One such technique is used for “Multi-Protocol Label Switched (MPLS) networks.” *Id.* at 1:7–8. LSPs that are formed according to this technique “operate in a unidirectional manner (*e.g.*, forwards or backwards),” *id.* at 1:11–13, and “MPLS-based devices can only create a single LSP in one direction at a time,” *id.* at 1:21–23. Another, newer technique was established by the “Generic MPLS” or “GMPLS” standard, “which sets forth techniques for creating LSPs in both directions, so-called ‘bi-directional’ LSPs.” *Id.* at 1:13–16. “[I]n GMPLS LSPs for both the forward and backward directions are set up simultaneously using a single request message or the like.” *Id.* at 1:19–20. Because of the differences in these techniques, prior to the invention of the ’140 patent, it was not possible to use newer GMPLS techniques with MPLS-based devices. *Id.* at 17–18, 1:23–24.

The inventors of the ’140 patent sought to bridge this gap by creating a way of “bundling separately created [forward and backward] LSPs,” such as those created according to MPLS

¹⁶ *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910–11 (2014).

techniques into “[b]i-directional LSPS.” *Id.* at 1:30–32. This “[b]undling is carried out by creating an LSP in one direction (*e.g.*, the forward path) and then creating a separately generated LSP in the opposite direction,” which “is referred to as a backward path.” *Id.* at 1:32–37. These “two LSPs will [then] act as a bi-directional LSP between the device and the source,” *id.* at 1:45–48, and can “us[e] GMPLS techniques” designed for bi-directional LSPs.

A. “a network device” (claims 1–6, 13, 15, 16–19, 34–38)

Brazos’s Proposed Construction	Juniper’s Proposed Construction
plain and ordinary meaning ¹⁷	“an MPLS (as opposed to GMPLS) device”

The patentees never engaged in lexicography to limit the “network device” in claims of the ’140 patent to “an MPLS (as opposed to GMPLS) device” and never disclaimed from the scope of their claimed invention any devices that perform, or are capable of performing, according to any other standard, such as GMPLS. Juniper’s proposed construction is, therefore, improper and should be rejected.¹⁸

Although the specification of the ’140 patent describes that the disclosed invention was originally developed in the context of “Multi-Protocol Label Switched (MPLS) networks,” *see, e.g.*, ’140 patent at 1:7, the claims, the specification, and prosecution history do not exclude from the scope of the inventions any particular devices that are capable of satisfying the claim limitations, including being operable to separately establish forward and backward LSPS using separately generated request messages. *See, e.g., id.* at 2:45–60. The ’140 patent describes that,

¹⁷ This term appears in the preambles of claims 1 and 16 and provides an antecedent basis for the term “the device” that appears in the bodies of those claims and claims that depend from them. Accordingly, the term “a network device” is a limitation of claims 1 and 16.

¹⁸ *Meetrix IP, LLC v. Citrix Sys., Inc.*, No. 1:16-cv-1033-LY, 2017 WL 5986191, at *2 (W.D. Tex. Dec. 1, 2017) (“a departure from the ordinary and customary meaning is the exception, not the rule”); *see also Augme Techs., Inc. v. Yahoo! Inc.*, 755 F.3d 1326, 1339 (Fed. Cir. 2014) (“Neither the specification nor the prosecution history includes any lexicography or disavowal that would justify a departure from the plain meaning.”).

at the time of the invention, the GMPLS and MPLS standards supported different, incompatible procedures for setting up LSPs. *See id.* at 1:17–25. In particular, under the GMPLS standard, it was only possible for “LSPs for both forward and backward directions [to be] setup simultaneously using a single request message or the like.” *Id.* at 1:19–21. In contrast, under the MPLS standard, it was not possible to establish “bi-directional” LSPs similar to those that could be established under GMPLS; rather, the MPLS standard could only be used to “create a single LSP in one direction at a time.” *Id.* at 1:21–25. The inventors of the ’140 patent, therefore, sought to bring GMPLS-like bi-directional LSP functionality to LSPs set up according to MPLS so that they could “us[e] GMPLS techniques.” *Id.* They accomplished this by creating a new inventive technique in which “a forward and backward LSP” are “separately generated and established,” which together “act as a bi-directional LSP.” *Id.* at 1:45–48.

Any network device capable of performing this inventive technique falls within the scope of the claims of the ’140 patent. This includes devices operating pursuant to the MPLS standard as disclosed by the ’140 patent, *id.* at 1:10–13, 1:21–23, as well as any other devices that are operable to perform the claimed elements. To the extent certain devices are not capable of separately establishing forward and backward LSPs, such as devices that operate according to the version of GMPLS that existed at the time of the ’140 patent, *see id.* at 1:13–21, such devices do not fall within the scope of the patent claims because they cannot perform the elements of the claims. This is a basic canon of patent law and does not require construction of the term “a network device.”

Juniper’s proposed construction also suggests a strict divide between devices that have MPLS functionality and devices that have GMPLS functionality, which does not exist. Nothing in the ’140 patent or its prosecution history indicates that devices with both MPLS and GMPLS

functionality are beyond the scope of the claimed inventions. In fact, at the time of the invention of the '140 patent, interoperability between MPLS and GMPLS devices was being tested. *See* Ex. 6, Fujitsu, *GMPLS Signaling Protocol Interoperability Test in Multilayer Network* (May 20, 2003), available at <https://www.fujitsu.com/global/about/resources/news/press-releases/2003/0520-11.html> (WSOU-Juniper-0003340). A press release issued about that test states that “[w]hen [] cross-connect equipment supports GMPLS control, path setup is established by exchanging control packets between these control devices as well as MPLS routers.” *Id.* Thus, support for both GMPLS and MPLS functionality would have been required in order to exchange control packets between “cross-connect equipment [that] supports GMPLS control” and “MPLS routers.” *Id.* Even the '140 patent itself states that its invention was developed from a desire to “use[] GMPLS techniques” *with* “MPLS-based devices,” '140 patent at 1:23–25, implying that the purpose of the invention of the '140 patent was to allow devices to support both MPLS and GMPLS. Juniper’s attempt to exclude from the scope of the claimed invention any devices that support GMPLS, even if those devices also support MPLS (or any other standard that enables them to be operable to perform the claimed elements), is contrary to both the purpose and the teachings of the '140 patent.

B. “the device” (claims 21–24, 31, 33)

Brazos’s Position	Juniper’s Position
plain and ordinary meaning, not indefinite	indefinite

This term carries its plain and ordinary meaning and is not indefinite. Juniper’s argument that claims 21–24, 31 and 33 are indefinite because the term “the device” lacks an antecedent basis is flawed. “[T]he lack of an antecedent basis does not render a claim indefinite as long as

the claim ‘apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by [§ 112, ¶ 2].’¹⁹ That is the case here.

The term “the device” first appears in independent claim 21 in the phrase “generating and sending an independent backward path request message to a source of a separately generated, initial forward path request message associated with a forward Label Switched Path (LSP) between the device and the source.” ’140 patent at 5:51–55. A person of ordinary skill in the art would have been familiar with LSPs, including from their use in multiple industry standards. Ex. 1, Nettles Decl. at ¶ 36 (citing use of LSPs in the RFC 3471 standard, “which deals with the ‘Generalized Multi-Protocol Label Switching (GMPLS) Signaling Functional Description’”). As part of this familiarity, a person of ordinary skill in the art “would have known that an LSP is a path that traffic flows along in a network between two ‘nodes.’” *Id.* This is shown, for example, in the description in RFC 3471, which states that “the term ‘initiator’ is used to refer to a node that starts the establishment of an LSP and the term ‘terminator’ is used to refer to a node that is the target of the LSP.” Ex. 8, RFC 3471 at WSOU-Juniper-0004913.

The specification of the ’140 patent uses LSPs in the same manner that a person of ordinary skill in the art would have been familiar with, including as being a path between two nodes. Ex. 1, Nettles Decl. at ¶ 36. For example, the ’140 patent describes “a bi-directional LSP ... between network device 2 operating as source device and network device 1 operating as a destination device.”²⁰ See ’140 patent at 2:23–25; *see also id.* at 3:33–4:13. Thus, “[t]here

¹⁹ *In re Downing*, 754 F. App’x 988, 996 (Fed. Cir. 2018) (citing *In re Packard*, 751 F.3d 1307, 1310, 1314 (Fed. Cir. 2014)); *see also Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006) (“When the meaning of the claim would reasonably be understood by persons of ordinary skill when read in light of the specification, the claim is not subject to invalidity upon departure from the protocol of ‘antecedent basis.’”).

²⁰ *See also, e.g.*, ’990 patent at 1:32–35 (“The different data streams may then be transmitted over diverse routes through the network from the source node to a given destination node”)

would be no confusion to a person of ordinary skill in the art regarding what ‘the device’ refers to in the claims and a person of ordinary skill in the art would have no difficulty determining whether there is ‘a forward Label Switched Path (LSP) between the device and the source,’ as recited in claim 21.” Ex. 1, Nettles Decl. at ¶ 37. “The device” “refers to the node at the opposite end of the LSP from ‘the source.’” *Id.* Accordingly, because a person of ordinary skill in the art could reasonably ascertain the scope of these claims, they are not indefinite.

C. “by itself generate ... a backward path [request / reservation] message” (claims 1, 16) / “generating ... an independent backward path [request / reservation] message” (claims 21, 23) / “by a network device generating ... a backward path reservation message” (claim 34)

Brazos’s Proposed Construction	Juniper’s Proposed Construction
plain and ordinary meaning	“generate a backward path [request / reservation] message without using specific routing information provided in the forward request, such as bandwidth designations”

There is no dispute that the phrase “generate ... a[] backward path [request / reservation] message” as used in these claims has a plain and ordinary meaning that is readily understandable without the need for further construction because Juniper’s proposed construction repeats this phrase verbatim. Juniper’s proposed construction merely seeks to add a limitation—*i.e.*, that the “backward path [request/reservation] message” is generated “without using specific routing information provided in the forward request, such as bandwidth designations”—but there is no lexicography or disclaimer in the intrinsic evidence to support it. Indeed, neither the specification of the ’140 patent or its file history support this requirement.

Although the ’140 patent describes “that the forward and backward LSPs are generated using separately generated forward and backward path request messages,” ’140 patent at 2:53–55, it does not state that no information from one of the messages may be used to generate the other message. Indeed, the ’140 patent specifically contemplates that “the initial, forward path

request message [may] also contain[] ‘backward path parameters’... [that may be used] to initiate the creation of a backward LSP.” *Id.* at 2:45–48; *see also id.* at 2:61–67 (“[B]ackward path parameters contained within the initial forward path request message [] are used to initiate the steps necessary to create a backward LSP. ... The backward path parameters may comprise one or more of the following: a bi-directional LSP indicator, a QoS indicator and/or routing information.”). The ’140 patent explicitly states that where a “network device [] uses the backward path parameters [included within the initial forward path request message] to generate ... a backward path request message ... [t]his request message is *separately* generated from the forward path request message.” *Id.* at 2:49–53. Juniper’s construction would exclude this preferred embodiment and should therefore be rejected because “a claim construction that excludes [a] preferred embodiment ‘is rarely, if ever, correct and would require highly persuasive evidentiary support.’”²¹

V. U.S. PATENT NO. 7,620,273 (CASE NO. 6:20-CV-00902-ADA)

In networking, data may be transmitted via optical fibers. ’273 patent at 1:11–14. As data is transmitted via optical fibers through a network, it is passed from node to node by networking equipment at each node. This equipment includes “electronic ‘cross-connection’ equipment” that processes the signals by converting them from optical signals to electrical signals and back to optical signals. *Id.* at 1:27–35.

At the time of the invention of the ’273 patent, one type optical fiber network known as “ultra, long reach” (‘ULR’) optical fiber networks [were] in the planning stages or just being built.” *Id.* at 1:14–15. These ULR networks enabled the “transmi[ssion] [of] signals extremely

²¹ *Adams Respiratory Therapeutics, Inc. v. Perrigo Co.*, 616 F.3d 1283, 1290 (Fed. Cir. 2010) (quoting *Vitronics Corp. v. Conceptor Inc.*, 90 F.3d 1576, 1583-84 (Fed. Cir. 1996)).

long distances without the need to process the signals other than simple amplification.” *Id.* at 1:16–19.

The ’273 patent describes “an optical connection device” for use in these ULR networks. ’273 patent at 1:67–2:1, 1:14–15. The inventors of the ’273 patent realized using existing cross-connection equipment in these ULR networks was “a potential waste of resources,” *id.* at 1:34–36, because “signals within a ULR link ... may not need to be processed at all at any given ‘node,’” *id.* at 1:34–36. Accordingly, the inventors of the ’273 patent devised “an optical, service-enabled connection unit 10 [that] is adapted to dynamically process one or more optical signals from one or more links ... based on a characteristic of each signal within [the] links.” *Id.* at 2:27–30. With this arrangement, “[o]nly when the characteristics of the signal indicate that processing is needed is a processing unit connected to the signal.” *Id.* at 2:4–6. “As such, [processing] units are no longer dedicated to each signal[, which] reduces the cost of the overall network, among other things.” *Id.* at 2:6–8.

A. preambles of claims 1 (“A connection device”) and 2 (“A router”)

Brazos’s Position	Juniper’s Position
the preambles are not limiting	the preambles are limiting

The preambles of claims 1 and 2 of the ’273 patent simply recite “[a] connection device” and “[a] router,” respectively. As these words do not “recite[] essential steps or structure,”²² and are not “necessary to give life, meaning, and vitality” to the claims, they are not limiting and do not need to be construed.²³

²² *Catalina Mktg. Int’l, Inc.*, 289 F.3d at 808.

²³ *Pitney Bowes, Inc.*, 182 F.3d at 1305. *See also Ancora Techs., Inc.*, 2020 WL 4825716, at *6 (“Courts presume that the preamble does not limit the claims.” (citing *Am. Med. Sys., Inc.*, 618 F.3d at 1358)); *see also Georgetown Rail Equip. Co.*, 867 F.3d at 1236 (“Generally, the preamble does not limit the claims.” (citations omitted)).

The terms “connection device” and “router” do not provide antecedent basis for any term recited in the body of claim 1 or 2.²⁴ Nor do the claims or specification describe a “connection device” or a “router” as providing any essential structure necessary to perform the claimed steps that the invention must be programmed to perform. Rather, the claims themselves “define[] a structurally complete invention in the claim body,”²⁵ including “one or more non-dedicated, processing units” and “an optical switch for receiving Ultra-Long Haul (ULR) optical signals and for connecting at least one of the units to one or more of the received signals based on a characteristic of each signal.” Neither the claim nor the specification describes any further structure that is required for the claimed invention to “dynamically process one or more optical signals from one or more links ... based on a characteristic of each signal within [the] links,” *id.* at 2:27–30, thereby eliminating the need for unnecessary dedicated processing units for each signal. Thus, the recitations in the preambles of claims 1 and 2 of the ’273 patent of “[a] connection device” and “a router” are merely statements of “intended use for the invention” that identify the type of devices in which the invention may be used, and should not be construed as limiting.²⁶

VI. U.S. PATENT NO. 8,284,656 (CASE NO. 6:20-CV-00903-ADA)

Virtual private local area network services (“VPLS”) are used in computer networking to allow networking and computer equipment that may be in different locations and on different

²⁴ See *Catalina Mktg. Int’l*, 289 F.3d at 808 (“dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention” (citing *Corning Glass*, 868 F.2d at 1257)).

²⁵ *Id.* (preamble not limiting ‘where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention’” (quoting *Rowe*, 112 F.3d at 478)).

²⁶ See *Rowe*, 112 F.3d at 478.

local area networks (“LANs”) “to be on the same LAN regardless of their actual location. ’656 patent at 1:22–30. An important networking component in the creation of a VPLS are the “provider edge nodes.” *Id.* at 1:33–34. These provider edge nodes establish the connections between the networking and computer equipment on one local area network and the networking and computer equipment on another local area network through tunnels formed through “an access cloud.” *Id.* at 1:45–67.

Issues can arise in a VPLS when links between provider edge nodes fail, potentially interrupting the delivery of communications between various parts of the network. *See id.* at 1:35–40. For this reason, “protection switching between the access cloud and the provider edge nodes is often employed ... to help ensure delivery of service between the access cloud and provider edge nodes.” *Id.* at 1:35–40. Under prior art protection switching techniques, “[i]n the event of a failure or degradation of the signal of an active circuit [known as the “working circuit”] ... the data traffic [is switched] from traversing the failed or degraded circuit to traversing [an]other circuit,” known as the “protection circuit.” *Id.* 3:39–43. “The [protection] circuit becomes active and the failed or degraded [working] circuit becomes the inactive circuit.” *Id.* at 3:43–44; *see also id.* at 4:28–30. One issue with switching data traffic from the working circuit to the protection circuit is that other provider edge nodes in the VPLS “will keep sending traffic to the de-activated provider edge node until they relearn the [] address mappings ... of the newly active provider edge node (previously the protection chassis).” *Id.* at 4:37–41. “This causes black-holing of traffic for a time,” *id.* at 4:41–44, meaning that traffic may be lost because it is inadvertently being sent to the now inactive circuit rather than the newly activated protection circuit.

The inventions of the '656 patent provide an improved mechanism of protection switching where “knowledge of a failure ... occurs very quickly after the failure” and “invoke[s] early initiation of re-convergence of the VPLS provider edge nodes.” *Id.* at 6:17–25. This means that other nodes in the VPLS will quickly learn of the switchover between working and protection circuits, avoiding the inadvertent “black-holing of traffic.” *See id.* at 8:33–39.

A. preambles of claims 1 (“A system of redundant pair automatic protection switching at the edge of a Virtual Private LAN system (VPLS) network”) and 2 (“The system of claim 1”)

Brazos’s Position	Juniper’s Position
the preambles are not limiting	the preambles are limiting

The preambles of claims 1 and 2 of the '656 patent are not limiting because they do not “recite essential structure or steps,”²⁷ are not “necessary to give life, meaning, and vitality.”²⁸ Further, no claims elements “depend[] on [the] ... preamble phrase for antecedent basis” and there was no “clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art.”²⁹

Claim 1 recites:

A system of redundant pair automatic protection switching at the edge of a Virtual Private LAN System (VPLS) network comprising³⁰

²⁷ *Catalina Mktg. Int’l, Inc.*, 289 F.3d at 808.

²⁸ *Pitney Bowes, Inc.*, 182 F.3d at 1305. *See also Ancora Techs., Inc.*, 2020 WL 4825716, at *6 (“Courts presume that the preamble does not limit the claims.” (citing *Am. Med. Sys., Inc.*, 618 F.3d at 1358)); *see also Georgetown Rail Equip. Co.*, 867 F.3d at 1236 (“Generally, the preamble does not limit the claims.”) (citations omitted)).

²⁹ *Georgetown Rail Equip. Co.*, 867 F.3d at 1236 (citations omitted).

³⁰ Brazos added a line break here in claim 1 to more clearly visually distinguish the preamble of the claim (“A system of redundant pair automatic protection switching at the edge of a Virtual Private LAN System (VPLS) network”) from the body (which begins with “a redundant pair of provider edge nodes ...”). This accords with the claiming practice defined by 37 C.F.R. § 1.75(e), which states that “any independent claim should contain in the following order: (1) A preamble comprising a general description of all the elements or steps of the claimed

a redundant pair of provider edge nodes comprising:

a first provider edge node that is a working node of the redundant pair before a switchover and a protection node of the redundant pair after the switchover, and

a second provider edge node that is the protection node of the redundant pair before the switchover and the working node of the redundant pair after the switchover; and

a third provider edge node possessing a media access control (MAC) address entry for the first provider edge node, previously learned by the third provider edge node, wherein the first provider edge node, when functioning as the working node, communicates with the third provider edge node, and, after the switchover in the redundant pair, sends an explicit request to the third provider edge node to flush said MAC address entry for the first provider edge node.

Claim 2, which depends from claim 1, adds the limitation “wherein the redundant pair of provider edge nodes is an Automatic Protection Switching (APS) 1+1 redundant pair.

combination which are conventional or known, (2) A phrase such as ‘wherein the improvement comprises,’ and (3) Those elements, steps and/or relationship which constitute that portion of the claim combination which the application considered as the new or improved portion.”). In this claim, the transitional phrase that is required by 37 C.F.R. § 1.75(e) is the word “comprising” that follows “A system of redundant pair automatic protection switching at the edge of a Virtual Private LAN System (VPLS) network,” and the “elements ... which constitute that portion of the claim combination which the application considered as the new or improved portion” begin with the element “a redundant pair of provider edge nodes.” This is further shown by the prosecution history of the application for the ’656 patent, which originally presented claim 1 with this explicit visual arrangement. *See* Ex. 7 at WSOU-Juniper-0002129 (May 31, 2006 application at 16); *see also id.* at WSOU-Juniper-0002180 (Dec. 26, 2008 Amendment Under 37 C.F.R. § 1.111 at 2), WSOU-Juniper-0002225 (Apr. 20, 2009 Amendment Under 37 C.F.R. § 1.111 at 2), WSOU-Juniper-0002321 (Mar. 23, 2010 Amendment Under 37 C.F.R. § 1.111 at 2), WSOU-Juniper-0002473 (Apr. 18, 2011 Appeal Brief at 22), WSOU-Juniper-0002506 (Apr. 26, 2011 Appeal Brief at 22). At some point during the prosecution, this line break was removed for unknown reasons without indication or comment. *See id.* at WSOU-Juniper-0002566 (Aug. 17, 2011 Amendment Under 37 C.F.R. § 1.111 at 2). This removal carried over through the remainder of the prosecution, *see id.* at WSOU-Juniper-0002674 (May 4, 2012 Amendment Under 37 C.F.R. § 1.111 at 2), and into the issued version of the claim. *See* ’656 patent at 8:53–56. As the removal of the line break appears to have been done without purpose and the treatment of “A system of redundant pair automatic protection switching at the edge of a Virtual Private LAN System (VPLS) network” as the preamble and “a redundant pair of provider edge nodes” as an element of the claim is supported by 37 C.F.R. § 1.75(e), Brazos reintroduces the line break here for clarity.

Here, the preamble—“a system of redundant pair automatic protection switching at the edge of a Virtual Private LAN System (VPLS) network comprising”—is set off from the body of the claim by the word “comprising.” It merely highlights the primary intended use of the invention and does not recite essential structure.³¹ The essential structure of the claim follows the first recitation of the word “comprising” and is “a redundant pair of provider edge nodes comprising a first provider edge node ... and a second provider edge node” and a “third provider edge node” As in *Georgetown Rail Equip.*, “[t]he location of [claimed] system”—here, “at the edge of a Virtual Private LAN System (VPLS) network” in the preamble of claim 1—“is not an essential feature of the invention.”³² Nor does “[a] system of redundant pair automatic protection switching” describe any essential structure. The elements of the claims themselves recite that the first and second provider edge nodes are “node[s] of the redundant pair.” The claims further describe that redundancy is achieved by having the first and second nodes switch their roles as “a working node” and a “protection node” after “a switchover” and sending information in the form of “an explicit request ... to flush [a] MAC address entry for the first

³¹ See *Georgetown Rail Equip. Co.*, 867 F.3d at 1236–37 (preamble that “describe[s] the principal intended use of the invention [does] not [] import a structural limitation”).

³² *Id.* at 1237. In *Georgetown Rail Equip.*, the preamble at-issue was “mounted on a vehicle for movement along the railroad track.” *Id.* at 1236. The Federal Circuit found that this was “meant to describe the principal intended use of the invention” but that “[t]he location of the system [was] not an essential feature of the invention.” *Id.* at 1236–37. In support of this, the Federal Circuit cited the fact that the specification disclosed other locations where “the disclosed inspection system can be mounted” and “explicitly state[d] that the relevant computation and processing of the data using the patented algorithms and the processing device ... also do not need to be performed on or affixed to a vehicle.” *Id.* at 1237 (internal quotation marks omitted). Similarly here, the location of the claimed system is not an essential part of the claimed invention because the ’656 patent specifically describes that “[a]though the preferred embodiment utilizes an MN-APS 1+1 redundant pair *at the edge of the VPLS network, other kinds of redundant automatic protection switching could be used* as long as the previously active node sends the explicit request for MAC address entry flushing.” ’656 patent at 8:43–47 (emphasis added).

provider edge node” to other nodes in the system (*i.e.*, the claimed “third provider edge node”). *See* ’656 patent at 8:57–9:4. This enables the other nodes to communicate with the second edge node as the working node after the switchover. *See id.* at 7:26–31, 7:65–8:25. Neither the claims nor the specification describes any further structure that is required for the claimed invention to provide the desired improvement in resiliency. Thus, the claim body standing alone describes a structurally complete system and the preamble of claims 1 and 2 should not be construed as a limitation.³³

Respectfully submitted,

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³³ *See Georgetown Rail Equip. Co.*, 867 F.3d at 1236–37.

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